

Please replace the sentence beginning at page 6, line 11, with the following rewritten sentence:

--The connections 228 and 229 are done using an Operating System/Network Element (OS/NE) protocol such as SNMP for IP domain network elements and connection 228 TL-1 for SONET equipment.--

In the claims:

Please cancel claims 1 through 11.

Please add new claims 12 through 23.

12. A method for realizing the physical layer topology of a network comprising a plurality of distinct domains, said method comprising the steps of:

storing an electronic serial number and model number for network elements of the distinct domains;

sending a request packet to a network element in one of said domains for use in a physical layer auto-discovery protocol, said request packet comprising a first packet protocol identifier and a sequence number;

receiving a response packet from said network element for use in a physical layer auto-discovery protocol, said response packet comprising a second packet protocol identifier, said sequence number, and said electronic serial number and model number of said network element; and

providing said response packet to a network management system common to all of said distinct domains.

13. The method of claim 12 wherein said request packet and said response packet both also include padding so that said packets have the same number of bytes.

14. The method of claim 12 wherein said network is an optical network.

15. The method in accordance with claim 12 wherein said physical layer auto-discovery is done at a low layer in the protocol stack.

16. The method in accordance with claim 15 wherein said physical layer auto-discovery is done at the lowest layer in the protocol stack, in order to be able to discover elements within all high-layered protocol domains.

17. A system for realizing the physical layer topology of a network including a plurality of distinct domains, said system including:

- a network management system common to said plurality of distinct domains;
- means for identifying network elements in said domains by encoded serial and model numbers;
- means responsive to a request for conducting a physical layer auto-discovery protocol for a network element in one of said domains;
- means for receiving a response packet from said one of said domains requested to conduct a physical auto-discovery protocol; and
- means for forwarding said response packet to said network management system.

18. The system in accordance with claim 17 wherein said network is an optical network.

19. The system in accordance with claim 12 wherein said physical layer auto-discovery is done at a low level in the protocol stacks of said one of said domains.

20. The system in accordance with claim 19 wherein said physical auto-discovery is done at the lowest level in said protocol stack.

21. A method for realizing the physical layer topology of a network comprising a plurality of distinct domains and a network management system common to said distinct domains, said method comprising the steps of:

- uniquely identifying network elements in said domains;
- sending a request packet to one of said domains;
- conducting a physical layer auto-discovery at a low level in the protocol stack at said one domain for a specific network element at said one domain in response to said request packet;
- forwarding a response packet from said one domain; and
- providing said response packet to said network management system.

22. The method in accordance with claim 21 wherein said step of uniquely identifying network elements includes electronically storing the serial number and model number of said network elements.

23. The method in accordance with claim 22 wherein said low level is the lowest level in said protocol stack.